



CTN Test Report
90-041

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Prepared for
Air Force Logistics Command
Air Force CALS Test Bed (LMSC/SN)
Wright-Patterson AFB, OH 45433

Technical Publication
Transfer Test Using
Raytheon Service Company
Provided Data:
MIL-M-28001 (SGML) and
MIL-R-28002 (Raster)

Quick Short Test Report

October 11, 1990

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1. Test Parameters

Test Plan: AFTB 90-12

Date of
Evaluation: October 11, 1990

Evaluators: Air Force CALS Test Bed
HQ AFLC IMSC/SNX
Wright-Patterson AFB, OH

Data
Originator: Raytheon Service Company
P. O. Box 503, Dept. 9431
2 Wayside Road
Burlington, MA 01803

Data
Description: Technical Manual Radar Receiver Group Waveform
Generator for Radar Set Semitrailer Mounted:
AN/MPQ-53 (Intermediate Maintenance Manual)
1 document declaration file
1 DTD file
1 text file
43 raster files

Data
Source System:

Text/SQML FutureNet database (origination)
FastTag (Avalanche) software
XYVision software
Developed on XYVision publishing system

Raster FutureNet (origination)
AutoCAD (origination)
HPGL
XYVision Xyraster

Evaluation
Tools Used:

184CA SUN 3/280
CTN Tapetools (v1.0) UNIX
Agfa Compugraphics CALS

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SGML Cheetah Gold 486
 Exoterica XGML
 Agfa Compugraphics CALS

Raster Sun 3/60
 CTN Raster Tools
 Agfa Compugraphics

Standards

Tested:

MIL-STD-1840A Notice 1 (1840A)
MIL-M-28001 (28001)
MIL-R-28002 Amendment 1 (28002)

2. INTRODUCTION

2.1 Background

The DoD Computer-aided Acquisition and Logistic Support (CALS) Test Network (CTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The CTN is a DoD-sponsored confederation of voluntary participants from industry and government managed by the Air Force Logistics Command.

The primary objective of the CTN is to evaluate the effectiveness of the CALS standards (Standards) for technical data interchange and to demonstrate the technical capabilities and operational suitability of those Standards. Two general categories of tests are performed to evaluate the Standards, formal and informal. Formal tests are large, comprehensive tests that follow a written test plan, require specific authorization from DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, taking only a few hours to set up and execute. They are used by the CTN technical staff to broaden the testing base by including representative samples of the many systems and applications used by CTN participants. They also allow the CTN staff to gain feedback from many industry and government interpretations of the Standards, to increase the base of participation in the CALS initiative, and to respond, in a timely manner, to the many requests for help that come from participants. Participants take part voluntarily and are benefited by receiving an evaluation of their latest implementation (interpretation) of the Standards, interacting with the CTN technical staff, gaining experience in use of the Standards, and developing increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

2.2 Purpose

The purpose of the informal test reported in this QSTR was to analyze Raytheon Service Company's interpretation and use of the CALS standards in transferring technical publications data. Raytheon used its CALS Technical Data Interchange System to produce data in accordance with the Standards and delivered it to the CTN technical staff on a 9-track magnetic tape.

3. 1840A Analysis

3.1 External Packaging

The tape arrived at the Air Force Test Bed enclosed in a box IAW ASTM D 3951. The exterior of the box was not marked with the required magnetic tape warning label, MIL-STD-1840A, para. 5.3.1.3. "Magnetic Material" was written across the package.

The tape was not enclosed in a barrier bag or barrier sheet material as required by MIL-STD-1840A, para. 5.3.1.2. Inspection of the tape reel showed the required label indicating the recording density as required by MIL-STD-1840A, para. 5.3.1. Some nine-track tape units require this BPI to be set manually. Also on the tape was a label listing the names and volume numbers of the tape and the contents of the declaration files.

3.2 Transmission Envelope

The nine-track tape received by the Air Force Test Bed contained MIL-STD-1840A files. The files were named per the standard conventions.

3.2.1 Tape Formats

The 1840A Tape was run through the AFTB TAPETOOL utility version 1.1. Two types of errors were encountered while evaluating the contents of the tape labels. All of the errors are shown in Appendix A, section two, Tape Import Log.

One error occurred relating to the tape label Record Length field for Type D files. This error occurred in the header files for the document declaration, the DTD, and the text files. Type D files contain variable length records that do not span blocks. All of the Type D files written on the tape were flagged with an illegal value for Record Length. The D001, D001G001, D001T002 files were expected to be Type D according to MIL-STD-1840A. The CTN TAPETOOL Software is expecting a value of 260 in the Record Length field but encountered a record length of 256. MIL-STD-1840A, para. 5.2.1.3 requires the variable record size be a maximum of 256 bytes. ANSI X3.27 para. 7.2.3 further states that the length of a Record Control Word (RCW) must be included in a Measured Data Unit (MDU) record length computation. This adds our bytes to the 256 for an MDU total of 260 bytes. ANSI X3.2,7 para. 8.5.2.6, states that the Record Length field for Type D files shall

specify (contain) the maximum length of an MDU. While MIL-STD184 permits variable length records, some software programs are sensitive to the number 260 because it is used to limit the record size when unblocking data. Some systems need this value to declare the maximum allowable record size as an attribute of a file when it is created. Thus the 256 in the variable record size did not add in 4 bytes for the RCW.

The second error occurred in all of the files. According to ANSI X3.27, para. 6.5.1, "All sections of a file shall be numbered consecutively starting from 1." Each File Section Number field in each file contained the value "0000".

A third error was found by our test team. At the end of the document, there are two end of volume files. The program read these files as there was another tape, which we did not receive. According to ANSI X3.27, para. 6.4 (Relationship of File Sections to a Volume), "The information on a volume shall consist of the sequence of blocks and tape marks as listed below, recorded consecutively:

- Beginning of Volume Label Group
- one or more Labeled-Sequences
- tape mark

Any recording following the last tape mark of the sequence shall be ignored in interchange." Further evaluation was not possible due to the inability to read the tape according to the ANSI standard. We had to assume we didn't have all of the tapes. End of volume files won't permit validation.

The tape was also evaluated using the Agfa Compugraphics CALS tools. The product also flagged the error at the end of tape. The error is as shown below.

```
read1840A: writing data file 'aftb9012/TM9-1430-601-34- /i0041.R.cci'  
read1840A: writing data file 'aftb9012/TM9-1430-601-34- /i0042.R.cci'  
read1840A: tape error - failed to find tapemark.
```

3.2.2 Declaration and Header Fields

Because of the error in the end of volume marks, the CTN TAPETOOL utility would not finish the evaluation. No error log was generated for this part of the tape.

The data files were named IAW MIL-STD-1840A, para. 5.1.3. A change report was submitted in 1989 to change this section. The change will require that each type of file start at 001. The

interpretation of this section varies. On this tape, the raster image file names start with d001r003. While correct, starting at a number above one could make it difficult to ensure all files have been included.

4. SGML Analysis

The AFTB compiled a separate DTD for the text file submitted for evaluation using information provided by Raytheon. When parsed with the XGML Normalizer Version 1.2e3.2, eight errors were reported. These errors were due to tagging problems in the D001T002 file. Raytheon reported the same eight errors during their parsing operation.

5. Raster Analysis

Fifteen of the 43 raster images were examined using the CTN CALSTB.350 utility. These 15 files were displayed correctly using this software product.

The same files were read using the Agfa Compugraphics read1840A. All 43 raster images were run through the Agfa raster program and displayed correctly on the screen.

6. Conclusions and Recommendations

In summary, the MIL-STD-1840A tape from Raytheon Service Company had one basic error in the way it was created. An end of volume marker was inserted which caused both tape reading utilities to flag the error. The CTN tape utility would not complete the processing because of the error.

Eight tagging errors were reported during the parsing of the SGML document.

No errors were found in the raster files.

The Raytheon Service Company tape provide both the Air Force Test Bed and Raytheon personnel a valuable learning experience.

7. Appendix A - Tape Tool Report Logs

7.1 Tape Catalog

CALS Test Network Tape Evaluation - Version 1.1

MIL-STD-1840A Tape Evaluation Catalog

Tue Oct 2 15:23:20 1990

Document File Set Directory: /cals/tapetool2/Set015

Page: 1

File Name	File Type	Record Type	Record Length
d001	Document Declaration	D	00256
d001g001	DTD	D	00256
d001t002	Text	D	00256
d001r003	Raster	F	00128
d001r004	Raster	F	00128
d001r005	Raster	F	00128
d001r006	Raster	F	00128
d001r007	Raster	F	00128
d001r008	Raster	F	00128
d001r009	Raster	F	00128
d001r010	Raster	F	00128
d001r011	Raster	F	00128
d001r012	Raster	F	00128
d001r013	Raster	F	00128
d001r014	Raster	F	00128
d001r015	Raster	F	00128
d001r016	Raster	F	00128
d001r017	Raster	F	00128
d001r018	Raster	F	00128
d001r019	Raster	F	00128
d001r020	Raster	F	00128
d001r021	Raster	F	00128
d001r022	Raster	F	00128
d001r023	Raster	F	00128
d001r024	Raster	F	00128
d001r025	Raster	F	00128
d001r026	Raster	F	00128
d001r027	Raster	F	00128
d001r028	Raster	F	00128
d001r029	Raster	F	00128
d001r030	Raster	F	00128
d001r031	Raster	F	00128
d001r032	Raster	F	00128
d001r033	Raster	F	00128

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d001r034	Raster	F	00128
d001r035	Raster	F	00128
d001r036	Raster	F	00128
d001r037	Raster	F	00128
d001r038	Raster	F	00128
d001r039	Raster	F	00128
d001r040	Raster	F	00128
d001r041	Raster	F	00128
d001r042	Raster	F	00128
d001r043	Raster	F	00128
d001r044	Raster	F	00128
d001r045	Raster	F	00128

7.2 Tape Import Log

CALS Test Network Tape Evaluation - Version 1.1

MIL-STD-1840A ANSI Tape Import Log

Allocating /dev/rmt0...

/dev/rmt0 allocated.

VOL1XYVI01

XYVISION R100

4

Label: VOL1

Volume Identifier: XYVI01

Accessibility:

Owner Identifier: XYVISION R100

Label-Standard Version:

HDR1D001

XYVI0100000001000100 90143000000 000000XYVISION R100

Label: HDR1

File Identifier: D001

File-Set Identifier: XYVI01

File Section Number: 0000

File Sequence Number: 0001

File Generation Number: 0001

File Generation Version Number: 00

Creation Date: 90143

Expiration Date: 000000

Accessibility:

Block Count: 000000

System Code: XYVISION R100

*** WARNING (FIPS PUB 79;5.12,5.13) - File section numbers must start at 1.

HDR2D0204800256

00

Label: HDR2

Recording format: D

Block Length: 02048

Record Length: 00256

Buffer-Offset Length: 00

*** ERROR (FIPS PUB 79;7.6.3) - Invalid variable record size encountered.

Header => 00256, Expected => 260

Variable record length includes 4 bytes for RCW.

HDR3

***** Tape Mark *****

HDR1D001G001 XYVI01000000020C0100 90143000000 000001XYVISION R100

*** WARNING (FIPS PUB 79;5.12,5.13) - File section numbers must start at 1.

HDR2D0204800256 00

```

*** ERROR (FIPS PUB 79:7.6.3) - Invalid variable record size encountered.
Header => 00256, Expected => 260
Variable record length includes 4 bytes for RCW.

```

HDR3

***** Tape Mark *****

Actual Block Size Found = 2048 Bytes.

***** Tape Mark *****

HDR1D001T002 XYVI0100000003000100 90143000000 000015XYVISION R100

Label: HDR1
File Identifier: D001T002
File-Set Identifier: XYVI01
File Section Number: 0000
File Sequence Number: 0003
File Generation Number: 0001

File Generation Version Number: 00
Creation Date: 90143
Expiration Date: 000000
Accessibility:
Block Count: 000015
System Code: XYVISION R100

*** WARNING (FIPS PUB 79;5.12,5.13) - File section numbers must start at 1.

HDR2D0204800256

00

Label: HDR2
Recording format: D
Block Length: 02048
Record Length: 00256
Buffer-Offset Length: 00

*** ERROR (FIPS PUB 79;7.6.3) - Invalid variable record size encountered.
Header => 00256, Expected => 260
Variable record length includes 4 bytes for RCW.

HDR3

***** Tape Mark *****

Actual Block Size Found = 2048 Bytes.

***** Tape Mark *****

HDR1D001R003 XYVI0100000004000100 90143000000 000164XYVISION R100

Label: HDR1
File Identifier: D001R003
File-Set Identifier: XYVI01
File Section Number: 0000
File Sequence Number: 0004
File Generation Number: 0001
File Generation Version Number: 00
Creation Date: 90143
Expiration Date: 000000
Accessibility:
Block Count: 000164
System Code: XYVISION R100

*** WARNING (FIPS PUB 79;5.12,5.13) - File section numbers must start at 1.

***** Tape Mark *****

EOV1D001R045 XYVI01000000047000100 70001000000 000060XYVISION R100

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Label: EOVI
File Identifier: D001R045
File-Set Identifier: XYVI01
File Section Number: 0000
File Sequence Number: 0047
File Generation Number: 0001
File Generation Version Number: 00
Creation Date: 70001
Expiration Date: 000000
Accessibility:
Block Count: 000060
System Code: XYVISION R100

EOV2F0204800128

00

Label: EOVI
Recording format: F
Block Length: 02048
Record Length: 00128
Buffer-Offset Length: 00

EOV3

***** Tape Mark *****

***** Tape Mark *****

End of Volume XYVI01

Deallocating /dev/rmt0...

Tape Import Process terminated before completion.

7.3 Tape Error Log

NOTE: Because of the unexpected end of volume files, this log could not be generated.

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8. Appendix B - XGML Parser Log